

**Five-Year Review Report**

**for**

**Johns' Sludge Pond Site**

**Wichita, Kansas**

**August 2002**

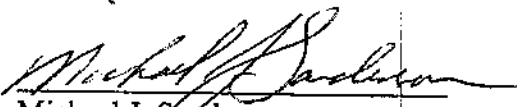
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9-23-02

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## List of Acronyms

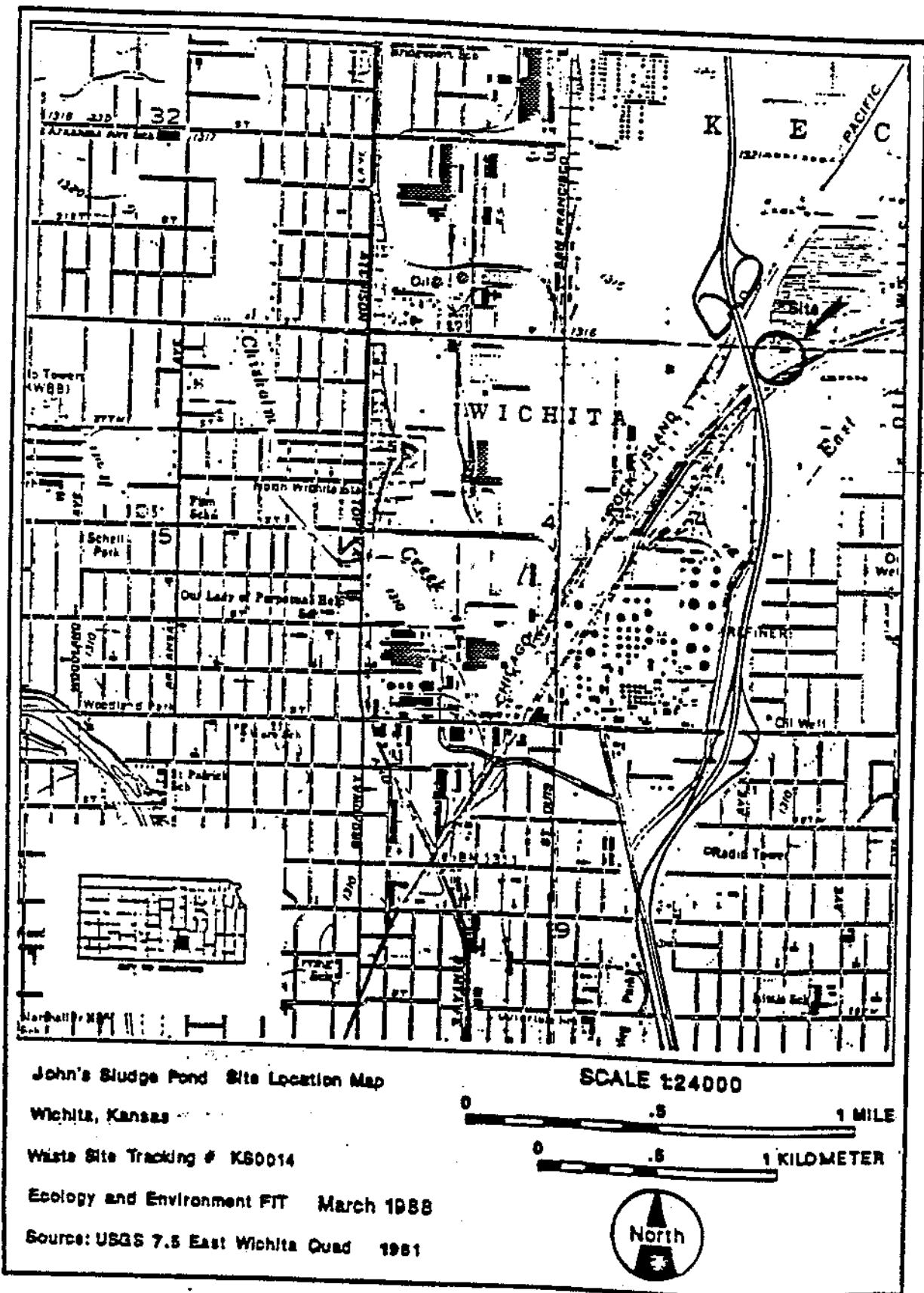
ARARs	Applicable or Relevant and Appropriate Requirements
BAT/BMP	Best Available Technology/Best Management Practices
CERCLA	Comprehensive Environmental Response, Conservation, and Liability Act
CFR	Code of Federal Regulations
HASP	Health and Safety Plan
KDHE	Kansas Department of Health and Environment
MCL	Maximum Contaminant Level
MG/KG	Milligrams per kilogram
MG/L	Milligrams per liter
MSL	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
PPM	Parts per million
PRP	Potentially Responsible Party
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAL	State Action Level
UG/KG	Micrograms per kilogram
UG/L	Micrograms per liter
UST	Underground Storage Tank
VOC	Volatile Organic Compound

## **Executive Summary**

The third five-year review of the Johns' Sludge Pond site in Wichita, Kansas, has been completed. The results of the five-year review indicate that the remedy is protective of human health and the environment. The remedy of no further remedial action was selected in the Record of Decision (ROD) which was agreed to by the Environmental Protection Agency (EPA) and the Kansas Department of Health and Environment (KDHE) on September 22, 1989. The EPA and KDHE found that the clean up already conducted at the site by the city of Wichita under EPA's oversight satisfied the criteria established in Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the selection of remedial actions and was protective of human health and the environment. In 1986, the city of Wichita completed a site clean up which consisted of (1) removal of contaminated sludge from the disposal cell and stockpiling on adjacent ground surface, (2) installation of a clay liner on the bottom of the disposal cell, (3) solidifying the stockpiled sludge with cement kiln dust, (4) redepositing the solidified sludge in the lined disposal cell, (5) constructing a compacted clay cap over the sludge and on the sidewalls of the disposal cell, (6) installation of a soil cover over the clay cap, and seeding with vegetation, (7) construction of a fence, (8) land use restrictions (specified in property deed and Consent Order), and (9) post-closure groundwater monitoring and surface water monitoring. The remedy has continued to be effective. The groundwater monitoring and surface water monitoring have been conducted by the Wichita-Sedgwick County Health Department and post-closure maintenance of the site is being provided by the city of Wichita Public Works Department.

Figure 1. Location Map

**Figure 1**



## Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Johns' Sludge Pond		
EPA ID (from WasteLAN): KSD980631980		
Region: VII	State: KS	City/County: Wichita/Sedgewick
SITE STATUS		
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: 09 / 23 / 1991	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Reviewing agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Catherine Barrett		
Author title: Remedial Project Manager	Author affiliation: EPA Region VII	
Review period: 09 / 2001 to 06 / 2002		
Date(s) of site inspection: 09 / 20 / 2001		
Type of review: <input checked="" type="checkbox"/> Statutory <input type="checkbox"/> Policy      ( <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion)		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input checked="" type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify) _____		
Triggering action date (from WasteLAN): 05 / 06 / 1997		
Due date (five years after triggering action date): 05 / 06 / 2002		



## Five-Year Review Summary Form

**Deficiencies:** None

**Recommendations and Follow-up Actions:**

The site should be maintained and groundwater monitoring and surface water monitoring should be conducted by the responsible party, the city of Wichita, Kansas, in accordance with the Consent Order and the Post-Closure Monitoring Plan.

**Protectiveness Statement:**

All immediate threats at the site have been addressed, and the remedy for the site is protective of human health and the environment.

**Long-term Protectiveness:**

Long-term protectiveness of the remedial action has been verified by obtaining groundwater and surface water samples. Current monitoring data indicate that the remedy is functioning as required to achieve groundwater clean-up goals.

## **Johns' Sludge Pond Site Five-Year Review Report**

### **I. Introduction**

The Environmental Protection Agency (EPA), in cooperation with the Kansas Department of Health and Environment (KDHE), has conducted a five-year review of the Superfund remedial action implemented at the Johns' Sludge Pond site in the city of Wichita, in Sedgwick County, Kansas.

The five-year review report is completed pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA); to Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substances Contingency Plan (NCP); and pursuant to EPA/Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P, Comprehensive Five-Year Review Guidance (June 2001).

The purpose of the five-year review is to ensure that the remedy at the site remains protective of human health and the environment. The five-year review report identifies any deficiencies found and provides recommendations.

This five-year review is required by statute and is implemented consistent with the CERCLA and the NCP. CERCLA Section 121 (c), as amended, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP Part 300.430 (f) (4) (ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the third five-year review for the Johns' Sludge Pond site. The triggering action for this review is the second five-year review.

## II. Site Chronology

Table 1 lists the chronology of events for the Johns' Sludge Pond site.

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TABLE 1      Chronology of Site Events

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Date	Event
1980	Initial discovery of the problem
12/30/1982	Proposal to National Priorities List (NPL)
09/08/1983	Final Listing on NPL
1983	PRP Search
02/1984	Preliminary Assessment
1983, 1985	Consent Orders
1986	PRP Removal
1989	PRP Feasibility Study
09/22/1989	Record of Decision
1991	Close Out Report
1991	First Five-Year Report
1992	Deletion from NPL
1994	Cost Recovery Decision Document
1997	Second Five-Year Report

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### **III. Background**

#### **Physical Characteristics**

The Johns' Sludge Pond site is located at 29<sup>th</sup> and Hydraulic Streets in the northern portion of the city of Wichita in Sedgwick County, Kansas. The site is approximately ½ acre and is in an area north of an industrialized section of Wichita. The site is located in the 500-year flood plain of the Little Arkansas River and is about 1,100 feet east of the river. Surface water runoff from the site drains into the East Fork of the Chisholm Creek. Chisholm Creek then drains into a concrete-lined ditch or canal approximately 6,000 feet south of the site. The concrete ditch parallels the adjacent Interstate Highway, I-135, and receives runoff from the highway before discharging into the Arkansas River in the southern part of the city, about 7.0 miles south of the site.

#### **Land and Resource Use**

Land uses immediately surrounding the site include a large rail yard south and southwest of the site, an interstate highway to the west, a large borrow pit to the north (excavated for the construction of the adjacent highway and now filled with water), and farm fields to the east and southeast of the rail yard. The nearest residences are approximately ½ mile south-southeast of the site. Much of the land in the vicinity of the site is industrialized and includes several large grain elevators, a rail yard, an oil refinery, and other industrial operations. A dirt road, which is elevated above the existing grade, separates the site from the borrow pit and prevents any runoff from the site from reaching the borrow pit.

The Arkansas River valley consists of unconsolidated alluvium and terrace deposits of Upper Pleistocene age (Wisconsin-Recent). These surficial deposits are composed of fine to coarse-grained sands and fine to coarse-grained gravels with clayey silt in the upper portions of the sequence. In the western part of the county, these deposits are an important groundwater source with the sands and gravels providing adequate water production rates. The rates decrease eastwardly as the percentage of clays and silts increase toward the eastern edge of the flood plain.

The alluvial deposits are underlain by the Wellington Formation which consists of calcareous shales, inter-bedded gypsum and anhydrite, and salt. In some western portions of the county, the salt thickness can reach as much as 300 feet.

Local groundwater flow direction has been calculated to be toward the south-southeast, using the monitoring wells around the site. The Wellington formation southeast of the site yields less water than the alluvium found closer to the river.

The alluvium thickness is generally about 50 feet thick at the site and consists of silty clay with sand intervals ranging from 5 to 15 feet in thickness. Eastwardly, the alluvium is thinner

and eventually is truncated, outcropping at the surface. The Wellington Formation also outcrops at the extreme eastern edge of the flood plain. Typically, any wells finished in the Wellington Formation would be completed between 40 and 50 feet deep, large in diameter (providing for adequate storage volumes), and used for limited domestic and livestock supplies or as process water. In general, the production rates in wells near the site are low. Within the bedrock, water occurs in solution cavities, crevices, and openings in the weathered upper portions of the Wellington Shale Formation and in the void spaces of the overlying alluvial soils.

Two municipal wells exist in the area but are located considerably up gradient (3 ½ to 4 ½ miles) and are not at risk of contamination by the site. The EPA completed a groundwater use survey and identified 13 private wells within 1 ½ miles of the site. Of these 13 wells, only three were used for drinking water; and all three of these are up gradient and are, therefore, at little or no risk of contamination by any contaminant releases from the site. All three of these wells appear to be above thicker alluvial deposits than are found down gradient of Johns' Sludge Pond site. The alluvial deposits yield more water and are more productive than the underlying shale found near the surface in the absence of the alluvium.

Groundwater at the site contains levels between 500 to 700 milligrams per liter (mg/l) total solids. Naturally occurring chloride concentrations also tend to be high and ranged between 38 to 227 mg/l. Although high, the chloride values are still less than the 250 mg/l Secondary Maximum Contaminant Level (SMCL) established by EPA under the Safe Drinking Water Act. The SMCL sets maximum levels for contaminants in water which could discourage or limit water use, when present at sufficient concentrations. The SMCLs deal with taste, odor, color, and corrosiveness of the water. SMCLs are advisory and not legally enforceable. The distribution of dissolved solids in the groundwater is closely related to the geology and hydrology of the area. The high concentrations of dissolved solids in the water are attributable to the Wellington Formation, where the shale contains large amounts of gypsum, anhydrite, and locally thin seams of salt. A zone of highly mineralized groundwater is found adjacent to the river. The zone is the result of movement of mineralized water from the river into the aquifer. Conductivity measurements taken in June 1987 indicated total solids concentrations ranging from 449 to 1079 mg/l.

On-site groundwater from monitoring wells tends to be very turbid, containing a large amount of suspended or particulate matter. The EPA analyzed groundwater for nephelometric turbidity units (NTUs) and reported a value of 101. The EPA has established a Maximum Contaminant Level (MCL) for surface water supplies of 1.0 NTU. This turbidity measure of 101 NTU in the on-site monitoring well water is an indication of the unsuitability of the groundwater as a drinking water source.

## **History of Contamination**

In the 1950s and 1960s up to 1970, the Johns' Sludge Pond site was used by the Super Refined Oil Company (also known as the Johns' Refinery) for the disposal of waste oil and oily sludge generated in its recycling/reclamation of motor oil and other oils at the Johns' Refinery,

located on 21<sup>st</sup> Street, approximately 1½ mile southwest of the Johns' Sludge Pond in Wichita. The recycling process used sulfuric acid and clay to precipitate and adsorb contaminants from the oil thereby creating acidic sludge containing elevated levels of lead. Polychlorinated biphenyls (PCBs) were introduced into the sludge through the recycling of dielectric fluids. The pond contained an estimated 15,000 cubic yards of oily sludge prior to clean up. In 1970, the Johns' Refinery went out of business shortly after the death of the owner-operator (at the time of waste disposal), Ava Johns. By 1983, the city of Wichita had acquired a portion of the site. The city had condemned and thereby acquired about one-half of the site in order to provide drainage for the interstate highway being built, which is now located immediately west of the site. The condemnation occurred before the site was placed on the National Priorities List (NPL) by EPA. The Johns' estate owns the remainder of the site.

The method of sludge disposal was to transport the semi-liquid, oily sludge to the site via truck and transfer it into the pond. Sulfuric acid was used by the owner at the time in refining waste oil for recycling. The inflow of surface water into the disposal cell resulted in a very acidic layer of water over the sludge layer. The cell was unlined and had no leachate collection system. Originally the cell lacked berms or any other measures to prevent the overflow and release of contaminated waters into nearby surface waters. During heavy rains the site would release contaminated water into the drainage of Chisholm Creek and the Arkansas River. Prior to EPA's involvement in the site, the city of Wichita built a berm around the site which prevented any additional contamination of surface waters.

### **Initial Response**

In 1983, during investigations by the city of Wichita and Sedgwick County, the sludge and water in the pond were found to be very acidic, with a pH as low as 1.0 in the water, and, the sludge was found to contain elevated concentrations of lead and low levels of PCBs, other metals, and other organics. Some of the wastes disposed at the site were flammable, as evidenced by the occasional fires which reportedly occurred several years before EPA's involvement with the site. Four shallow, alluvial monitoring wells surround the site and are used for groundwater sample collection. Groundwater, surface water, and sediment samples were collected at the site by EPA and by the city of Wichita and Sedgwick County Health Department.

The EPA placed this site on the NPL on September 8, 1983.

In November 1983, EPA issued a Consent Order under Section 106 of CERCLA to the city of Wichita, as the owner of the site, requiring an interim clean-up action to be conducted by the city of Wichita for this site. The city of Wichita submitted a work plan to EPA for this work, which EPA approved.

### **Basis for Taking Action**

The principal hazard associated with the wastes disposed in the pond was the acidity of

the sludge and of the water on top of the sludge. The water had a pH as low as 1.0. The sludge also contained high concentrations of lead and low levels of PCBs, other metals and other organics, and some of the wastes disposed at the site were flammable.

Interim remedial measures were implemented primarily to prevent direct contact exposures to the acidic, lead-contaminated sludge and water in the sludge pond. A secondary objective was to mitigate the site as a source of groundwater contamination.

## **IV. Remedial Actions**

### **Remedy Selection**

A ROD for the selection of the remedy was written and signed on September 22, 1989. The remedy recommended was the no further action alternative. The EPA evaluated the adequacy of the interim remedial actions and determined these actions to be the final remedial actions, with the post-closure maintenance, the groundwater monitoring, the surface water monitoring, the sediment monitoring, and the land use restrictions. The land use restrictions were included as part of the Consent Order.

### **Remedy Implementation**

In 1985 and 1986, the site remediation was completed by the city of Wichita under EPA oversight. The site clean up included the following remedy.

- (1) Sludge was removed from the existing disposal cell and stockpiled on the adjacent ground surface.
- (2) A compacted clay liner was constructed on the bottom of the disposal cell using clay soils of suitable density, plasticity, particle size, moisture content, compaction, and a permeability no greater than  $10^{-7}$  cm/second.
- (3) Stockpiled sludge was solidified with cement kiln dust. A ratio of 2 ½ :1 (cement kiln dust to sludge) was initially selected for treatment of the upper sludge and ½ :1 for the lower sludge. During remedy implementation, it was evident that portions of the sludge required additional quantities of cement kiln dust, which were used. Solidification of the sludge with cement kiln dust accomplished the following objectives:
  - It tied up the lead in the mixture of cement kiln dust and sludge and reduced the potential for lead to be released and contaminate groundwater;
  - It raised the pH of the sludge mixture and further reduced the potential for lead to be released and contaminate groundwater. (As the pH is raised, the solubility of lead in water is reduced); and,
  - It improved the structural stability of the sludge-cement kiln dust mixture to support a low permeability cap and cover, which reduced the potential for direct contact exposures and contaminant releases from the site.
- (4) The sludge-cement kiln dust mixture was then redeposited back into the lined disposal

cell. To further reduce the potential for direct contact exposures and to reduce the potential for water to percolate through the fixed sludge, a compacted clay cap over the top and on the sidewalls was installed. As with the clay liner, a permeability no greater than 10<sup>-7</sup> cm/second was achieved.

(5) To improve long-term stability and ensure continued encapsulation of the treated sludge, a soil and vegetative cover was installed above the clay cap. The soil cover consisted of a silty loam topsoil. A mixture of buffalo grasses was used as the vegetative cover.

(6) As the final step in the remedy, after the installation of the cap and cover was completed, a woven wire fence four feet in height was installed around the perimeter of the site. Warning signs were posted at various locations on the fence. The fence prevents dirt-bike riding and other activities which could damage the cap and cover. The fence also excludes unauthorized personnel from entering the site. A land use restriction was obtained for the property. The land use restriction prevents, or controls, changes in land uses which could interfere with the effectiveness of the clean up conducted, or which would have the potential to release contaminants into the environment.

This remedial action during 1985 and 1986 resulting in the stabilization of the sludge with the pozzolanic material and the capping of the site, created a chemical waste landfill under the Toxic Substances Control Act (TSCA), 15 U.S.C. 2600.

### **System Operation/Operation and Maintenance**

In October 1986, a Post-Closure Monitoring Plan was agreed to by EPA, KDHE, the city of Wichita, and the Sedgwick County Department of Health. The Environmental Health Division of the Wichita-Sedgwick County Department of Community Health has been responsible for the site monitoring with the Environmental Health Division Director serving as the point of contact for the monitoring activities. The monitoring under the Post-Closure Monitoring Plan was designated to be conducted for at least 20 years, commencing on January 1, 1987.

The Post-Closure Monitoring Plan required:

- monthly inspection of the physical features of the landfill such as cover integrity, vegetative cover, fences, warning signs, and, inspection of the slope and cap of the landfill for the presence of leachate seeps;
- semi-annual monitoring including (1) groundwater monitoring of four monitoring wells surrounding the landfill, three of these wells downstream of the landfill and one well upstream to be analyzed for PCBs and lead,  
(2) surface water monitoring of the borrow pit (pond) adjacent to the landfill (about 50 yards north) to include eight



grab samples, two at surface and two at depth to be analyzed for PCBs, lead, pH, and specific conductance, and,

(3) sediment monitoring of the adjacent borrow pit to include two sediment grab samples collected using an Eckman dredge to be analyzed for PCBs; and,

- depth-to-water measurements in the four groundwater monitoring wells.

The evaluation standards for the inspection of the physical features of the landfill were specified as:

(1) clay cap - visually inspect for erosion or uneven settling, and if detected notify the city of Wichita, Operations and Maintenance Division;

(2) vegetative cover - visually inspect for bare or dead areas larger than one square foot, and notify the city of Wichita, Operations and Maintenance Division if found, and, inspect for trees or woody vegetation taller than one foot, and remove by cutting if found;

(3) warning signs - inspect for legibility and replace if needed;

(4) fence - inspect for breaks, and repair if needed;

(5) discharges - inspect for discharge of leachate from the sides and cap of the landfill, and any leachate found, should be sampled (as well as adjacent soil) and analyzed for PCBs and lead, and EPA and KDHE should be notified if leachate is observed.

The Wichita-Sedgwick County Department of Health has been conducting the semi-annual groundwater, surface water, and sediment monitoring. The Wichita Public Works Department provides post-closure maintenance at the site of the cap, the vegetative cover, and the fence surrounding the site.

During 1991, additional monitoring wells were installed and data interpretation of contaminant flow sampling and analysis was provided by the U.S. Army Corps of Engineers through an Interagency Agreement with EPA.

The site achieved construction completion when the Close Out Report was signed on September 23, 1991.

The deletion of this site from the NPL was completed, and the final deletion notice appeared in the Federal Register on January 6, 1992.

Table 2 shows a summary of the concentrations of lead in the groundwater over the years from 1982 through 1996 for MW1, MW2, MW4, MW5, MW6, MW7, MW8, and MW9. Figure 2 shows the site including the locations of the monitoring wells and the sludge pond.

The Wichita-Sedgwick County Department of Health has continued to conduct the required semi-annual monitoring of groundwater from monitoring wells, and monitoring of surface water and sediments from the borrow pit for lead and PCBs during 1997, 1998, 1999, 2000, and 2001. No significant contamination has been detected during these sampling events since the second five-year review report in 1997. Table 3 shows contaminant concentrations from 1997 through 2001.

Operation and maintenance costs have been limited to the costs expended for the semi-annual groundwater, surface water and sediment monitoring and analysis, the semi-annual inspection of the site and the maintenance of the site.

## **V. Progress Since the Last Five-Year Review**

The last five-year review was completed on May 6, 1997. In the last five-year review the remedy was determined to be protective of human health and the environment. No issues were identified in the previous five-year reviews. Since the last review, the Wichita-Sedgwick County Department of Community Health has continued to conduct the groundwater monitoring of site monitoring wells and the surface water and sediment monitoring of the borrow pit (pond), and the Wichita Public Works Department has been responsible for the maintenance of the site.

## **VI. Five-Year Review Process**

The Johns' Sludge Pond site five-year review has included the following team members: Catherine Barrett, EPA Remedial Project Manager; Donna DeCarlo, KDHE Project Manager; Brian Fisher, Water Quality Planner for the Wichita-Sedgwick County Department of Community Health, and the EPA Community Involvement Coordinator.

This five-year review consisted of the following activities: a review of relevant documents (Attachment 1); discussions among representatives of the EPA, the state of Kansas, KDHE, and the Wichita-Sedgwick County Department of Health; a meeting with the city of Wichita-Sedgwick County Department of Community Health, EPA and KDHE; and a site inspection attended by the city of Wichita-Sedgwick County Department of Community Health, EPA, and KDHE. In addition, a notice regarding the initiation of the five-year review was placed in a local newspaper; and at the end of the review, a newspaper notice was placed indicating the availability of the five-year review report for the public. The completed five-year report is available in the information repository at the City Hall, city of Wichita, Kansas, at the KDHE, 1000 SW Jackson, Suite 410, Topeka, Kansas, and at EPA Region VII, Superfund Division Records Center, 901 North 5<sup>th</sup> Street, Kansas City, Kansas.

## **Site Inspection and Administrative Components**

Representatives of EPA, KDHE, and the city of Wichita-Sedgwick County Department of Community Health, took part in a site inspection on September 20, 2001. During the site inspection, the groundwater monitoring, the surface water monitoring, and the sediment monitoring were conducted, and the monitoring wells and site property were inspected. A summary of the monitoring results collected during 1997, 1998, 1999, 2000, and 2001 is included in Table 3.

## **Risk Information and Document Review**

Section 121 (d) of CERCLA, as amended by SARA, requires that remedial actions comply with applicable, or relevant and appropriate, requirements or standards (ARARs) under federal or state environmental statutes or regulations. Several ARARs have been considered in the ROD for this site.

If any groundwater impacted by the site is used for water supply, drinking water must meet the action level of 15 micrograms per liter (ug/l) for lead under the Federal Safe Drinking Water Act (SDWA). There are no drinking water wells at risk of contamination by the site. Because of the setting of the site, with the highway to the west and the borrow pit to the east, potential uses of the site are limited. Land use restrictions have been placed on the property to prevent any change in the land use. The action level for lead is not applicable at this site because the site has not contaminated public drinking water supplies. The action level for lead would be relevant because MCLs and action levels are considered relevant to groundwater at Superfund sites. However, the action level for lead is not considered appropriate because (1) lead found in on-site groundwater is associated with the suspended solids and has not been found in the sediment-free groundwater, (2) the aquifer beneath the site yields less than two gallons of water per minute which is insufficient for use as a public water supply, (3) the turbidity in groundwater is so high it is considered undrinkable, (4) the bicarbonates, carbonates and sulfates in the groundwater are so high that the water is unsuitable for domestic or commercial use, and (5) the iron concentrations in site groundwater limit the potential uses of the water because of staining, disagreeable taste, and encrusting and clogging of pipes.

The remedy complies with state groundwater clean-up rules which require “use of best available technology and best management practices (BAT/BMP) as long as it is reasonable and practical to remove all contaminants, and in any event until water contamination remains below the action level for any contaminant”. Action levels are Lifetime Health Advisory Levels for non-carcinogens and the one-in-a-million cancer risk for carcinogens. The remedy is considered to be BAT/BMP for this site.

The Resource Conservation and Recovery Act (RCRA) is not considered an ARAR for this site because the sludge was neither a RCRA-listed nor a characteristic hazardous waste.

The EPA Region VII considers the regulations on chemical waste landfills under the TSCA regulations to be ARARs for this site. The average concentration of PCBs in the sludge was 44 milligrams per kilograms (mg/kg), which is less than the 50 mg/kg level at which TSCA regulates current disposal. (Past PCB-waste disposal is currently regulated under TSCA at concentrations above 500 mg/kg.) Therefore, the TSCA regulations for chemical waste landfills are not applicable to this site. Nevertheless, the TSCA regulations are relevant and appropriate. For that reason the reconstructed disposal cell was designed and constructed to meet the technical requirements of a TSCA chemical waste landfill. PCBs have not been found in the groundwater in post-closure monitoring.

### **Data Review**

The historical and current concentrations of the contaminants of concern at the monitoring locations are presented in Table 2 and in Table 3.

### **Community Involvement**

A notice was sent to the local newspaper at the initiation of the five-year review of the remedial action taken at this site in order to inform the public. A fact sheet was prepared and distributed to the mailing list. When the five-year review was complete, a notice was placed in the local newspaper indicating the availability of the Five-Year Review Report for public viewing. The report is available to the public at the site information repository at the City Hall, Wichita, Kansas, at the KDHE offices, Bureau of Environmental Remediation, 1000 SW Jackson, Suite 410, Topeka, Kansas, and at the EPA Superfund Records Center, at 901 N. 5<sup>th</sup> Street, Kansas City, Kansas.

## **VII. Technical Assessment**

The following conclusions support the determination that the remedy at the Johns' Sludge Pond site is expected to continue to be protective of human health and the environment.

### **Question A: Is the remedy functioning as intended by the decision documents?**

- The Health and Safety Plan (HASP) - The HASP is in place, controlling risks and is properly implemented.
  
- Implementation of Institutional Controls and Other Measures - The city of Wichita continues to own the property which is the site, and there are no current or planned changes in land use at the site. A land use restriction has been obtained for the property, and this prevents changes in land uses which could interfere with the effectiveness of the clean up conducted.

- Remedial Action Performance - The remedy has been shown to be effective. The monitoring has indicated that the lead concentrations have been non-detect as shown in Table 3.

- System Operations/Operation & Maintenance - System operation and maintenance procedures are consistent with requirements of the Post-Closure Monitoring Plan.

- Cost of System Operations/Operation & Maintenance - Costs of operation and maintenance have been within an acceptable range.

- Opportunities for Optimization - The sampling frequency may be reduced because contaminants have been found to be non-detect.

- Early indicators of Potential Remedy Failure - No early indicators of potential remedy failure were noted during the review. Costs and maintenance activities have been consistent with expectations.

**Question B: Are the assumptions used at the time of remedy selection still valid?**

- Changes in Standards and To Be Considereds - No new standards have been introduced which would be more stringent or which would affect protectiveness at the site.

- Changes in Exposure Pathways - No changes in the site conditions that affect exposure pathways were identified as part of this five-year review. There are no current or planned changes in land use. No new contaminants, sources, or routes of exposure were identified as part of this five-year review. There is no indication that hydrologic or geologic conditions are not adequately characterized. The contaminant levels in groundwater, surface water, and sediments are consistent with expectations at the time of the ROD.

- Changes in Toxicity and Other Contaminant Characteristics - Toxicity and other factors for contaminants of concern have not changed.

- Changes in Risk Assessment Methodologies - There are no changes in risk assessment methodologies since the time of the ROD approval which call into question the protectiveness of the remedy.

**Question C: Has any other information come to light that could call into question the protectiveness of the remedy?**

- No additional information has been identified that would call into question the protectiveness of the remedy.

## **VIII. Issues/Deficiencies**

There were no deficiencies observed during this five-year review.

## **IX. Recommendations and Follow-up Actions**

No deficiencies were observed during this five-year review, and no follow-up actions are necessary at this time.

## **X. Protectiveness Statements**

The results of the five-year review indicate that the remedy is protective of human health and the environment. The remedy has been shown to be effective. The remedy protects human health and the environment. The solidification of sludge with cement kiln dust, the lining of the disposal cell, and the capping of the site reduced the solubility of lead, the principal chemical contaminant, and eliminated the threat to direct contact exposure. The site has not been shown to cause any significant adverse impact on the environment.

## **XI. Next Review**

This is a statutory five-year review. Five-year reviews have been conducted in the years 1991 and 1997. The Post-Closure Monitoring Plan requires that the monitoring of groundwater in monitoring wells and the monitoring of surface water and sediments in the borrow pit (pond) should continue for at least 20 years, until the year 2007. The next five-year review report will be conducted in the year 2007.

## **XII. Other Comments**

The city of Wichita-Sedgwick County Department of Community Health will continue to conduct the monitoring of groundwater, surface water, and sediments at the site.

# Ground Water Lead Concentrations through 1996-Johns' Sludge Pond

All data in ug/l or parts per billion (ppb)

MW1	MW2	MW4	MW5	MW6	MW7	MW8	MW9
1982 (EPA, total lead)							
ND	ND	655	NS	NS	NS	NS	NS
1984 (EPA, total)							
ND	56	121	NS	NS	NS	NS	NS
May 1987 (County, total)							
94	4.0	34	NS	NS	NS	NS	NS
November 1987 (County, lead)							
40	39	81	NS	NS	NS	NS	NS
January 1988 (EPA total/dissolved lead)							
180/ND	11/5	NS	ND/ND	260/ND	ND/ND	NS	NS
June 1988 (EPA total/dissolved)							
20/ND	11/6.5	74/15	14/ND	28/ND	NS	NS	NS
	360, 210/9*						
-1988 (County, total)							
6.0	7.0	133	7.0	8.0	6.0	NS	NS
Sept. 1990 (County, total)							
9.0	6.0	37	ND	6.0	8.0	6.0	ND
June 1990 (Corps of Engineers for EPA: total, dissolved, settled)							
ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND
ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND
August 1990 (COE for EPA: total, dissolved, settled)							
ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND
ND/ND	ND/ND	ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND	ND/ND/ND
April 1992 (County, total lead)							
ND	ND	ND	ND	ND	ND	ND	ND
April 1993 (County, total lead)							
ND	ND	ND	ND	ND	ND	ND	ND (at detection limit of 3 ppb)
September 1993 (County, total lead)							
ND	ND	ND	ND	ND	ND	ND	ND (at detection limit of 3 ppb)
March 1994, (County, total lead)							
ND	ND	ND	ND	ND	ND	ND	det limit: 3ppb
<u>MW1</u>	<u>MW2</u>	<u>MW4</u>	<u>MW5</u>	<u>MW6</u>	<u>MW7</u>	<u>MW8</u>	<u>MW9</u>

## September 1994 (County)

<u>MW1</u>	<u>MW2</u>	<u>MW4</u>	<u>MW5</u>	<u>MW6</u>	<u>MW7</u>	<u>MW8</u>	<u>MW9</u>	det limit:
ND	ND	ND	ND	ND	ND	ND	ND	3 ppb

## September 1995 (County)

ND	ND	ND	ND	ND	ND	ND	ND	det limit: 3 ppb
----	----	----	----	----	----	----	----	---------------------

## April 1996 (County)

ND	ND	ND	ND	ND	ND	ND	ND	det limit: 3 ppb
----	----	----	----	----	----	----	----	---------------------

## September 1996 (County)

ND	ND	ND	ND	ND	ND	ND	ND	det limit: 5 ppb
----	----	----	----	----	----	----	----	---------------------

ND-not detected

NS-not sampled

\* duplicate sample analysis



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Table 3. Groundwater, Surface Water, and Sediment Concentrations during 1997, 1998, 1999, 2000, and 2001.

---

Monitoring wells and surface water samples continued to be non-detect as follows.

PCB in water	ND (0.5) ug/l
Aluminum, dissolved	ND (0.10) mg/l to ND (0.50) mg/l
Lead, dissolved	ND (0.005) mg/l to ND (0.010) mg/l

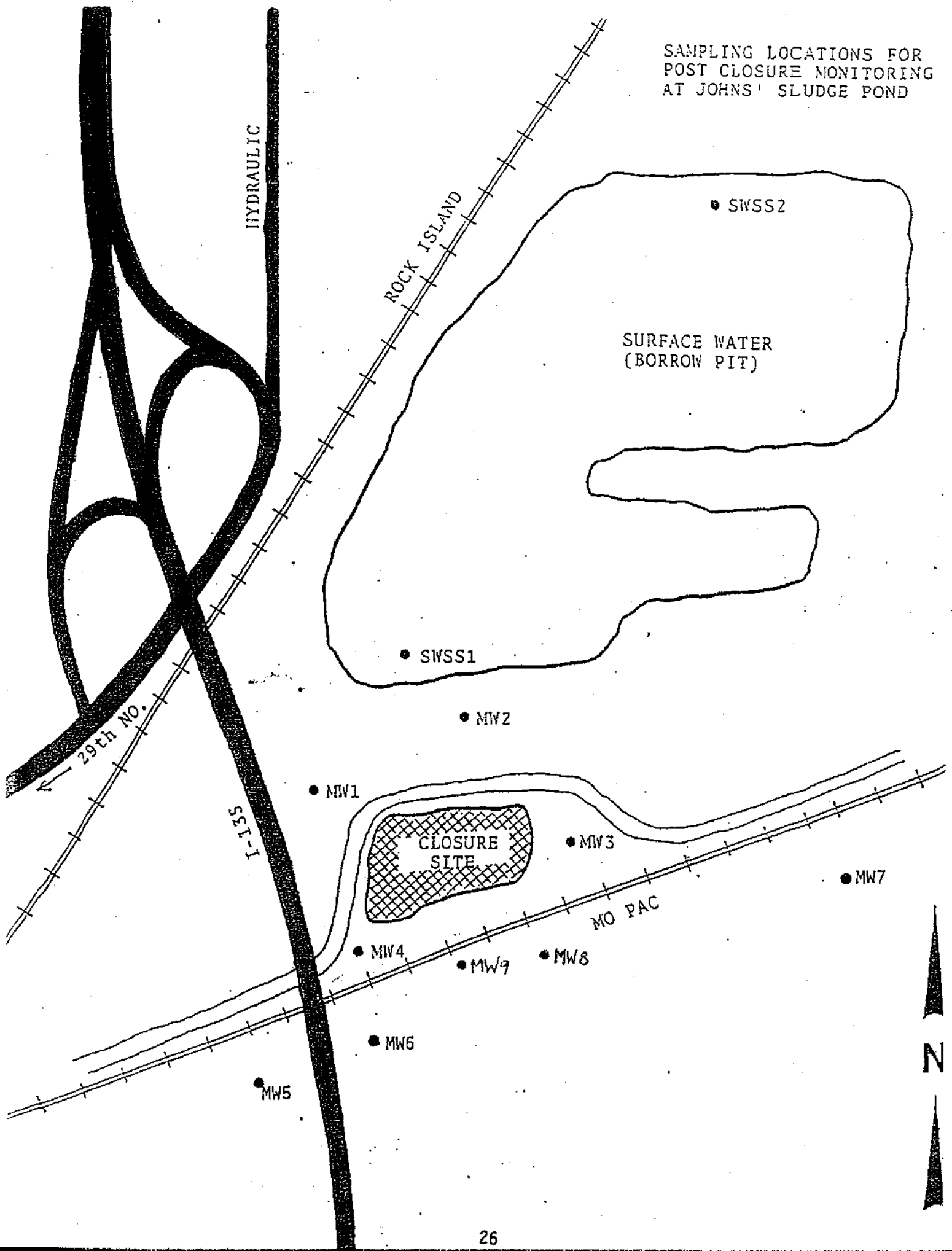
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Sediment samples from the borrow pit (pond) ranged as follows

	Mud #1	Mud #2
PCB in Solid	ND (.05 - .07) mg/kg	ND (.05 - .07) mg/kg
Aluminum, Total	5840 - 19,500 mg/kg	3090 - 19,700 mg/kg
Lead, Total	8.4 - 80.6 mg/kg	7.9 - 60.8 mg/kg

---

SAMPLING LOCATIONS FOR  
POST CLOSURE MONITORING  
AT JOHNS' SLUDGE POND



**Attachment 1**  
**Documents Reviewed**

## **Documents Reviewed**

“Consent Order In The Matter Of Johns’ Sludge Pond, City of Wichita, Kansas” by the city of Wichita and the Environmental Protection Agency, December 8, 1983.

“Removal Action Report”, by the city of Wichita, May 1, 1986.

“Post-Closure Monitoring Plan, Johns’ Sludge Pond Chemical Waste Landfill, Wichita, Kansas”, by the city of Wichita-Sedgwick County Department of Community Health, October 8, 1986.

“Record of Decision for Johns’ Sludge Pond, Wichita, Kansas”, by the Environmental Protection Agency, September 22, 1989.

“Close-Out Report for the Johns’ Sludge Pond Site, Wichita, Kansas”, by the Environmental Protection Agency, January 31, 1991.

“Five-Year Review Report for the Johns’ Sludge Pond Site, Wichita, Kansas”, by the Environmental Protection Agency, June 21, 1991.

“Five-Year Review Report for the Johns’ Sludge Pond Site, Wichita, Kansas”, by the Environmental Protection Agency, May 6, 1997.

“Memorandum - Johns’ Sludge Pond, Wichita, Kansas”, by the Environmental Protection Agency, May 6, 1997.

“Semi-Annual Monitoring Report - March, 1997 ”, by Wichita-Sedgwick County Department of Community Health, August 17, 1997.

“Semi-Annual Monitoring Report - September, 1997”, Wichita-Sedgwick County Department of Community Health, February 2, 1998.

“Semi-Annual Monitoring Report”, Wichita-Sedgwick County Department of Community Health, August 19, 1998.

“Semi-Annual Monitoring Report”, Wichita-Sedgwick County Department of Community Health, December 24, 1998.

“Semi-Annual Monitoring Report”, by Wichita-Sedgwick County Department of Community Health, June 4, 1999.

“Semi-Annual Monitoring Report”, by Wichita-Sedgwick County Department of Community Health, December 13, 1999.

“Semi-Annual Monitoring Report”, by Wichita-Sedgwick County Department of Community Health, May 15, 2000.

“Semi-Annual Monitoring Report”, by Wichita-Sedgwick County Department of Community Health, December 8, 2000.

“Laboratory Report - Analytical Results”, October 15, 2001, from Wichita-Sedgwick County Department of Community Health.

**Attachment 2**

**Sampling Data Results**

September 20, 2001 Sampling



# Continental

Analytical Services, Inc.

10/10/2001

OCT 15

City of Wichita  
Attn: Brian Fisher  
1900 E. Ninth  
Wichita, KS 67214

Date Received: 09/21/2001  
Continental File No.: 5535  
Continental Order No.: 73396  
Your P.O./Project No.: John's Sludge

Dear Mr. Fisher:

This laboratory report consisting of 8 pages contains the analytical results for the following samples:

<u>CAS LAB ID #</u>	<u>SAMPLE DESCRIPTION</u>	<u>SAMPLE TYPE</u>	<u>DATE SAMPLED</u>
01092080	MW #5	Liquid	09/20/2001
01092081	MW #6	Liquid	09/20/2001
01092082	MW #8	Liquid	09/20/2001
01092083	MW #9	Liquid	09/20/2001
01092084	MW #7	Liquid	09/20/2001
01092085	MW #2	Liquid	09/20/2001
01092086	TSWSS #1	Liquid	09/20/2001
01092087	BSWSS #1	Liquid	09/20/2001
01092088	MW #1	Liquid	09/20/2001
01092089	MW #4	Liquid	09/20/2001
01092090	TSWSS #2	Liquid	09/20/2001
01092091	BSWSS #2	Liquid	09/20/2001
01092092	Mud #1	Solid	09/20/2001
01092093	Mud #2	Solid	09/20/2001

Thank you for choosing Continental for this project. If you have any questions, please contact me at (800) 535-3076.

CONTINENTAL ANALYTICAL SERVICES, INC.

Gregory J. Groene  
Project Manager





# Continental

Analytical Services, Inc.

Page: 2

Client: City of Wichita  
Attn: Brian Fisher  
1900 E. Ninth  
Wichita, KS 67214

Date Sample Rptd: 10/10/2001  
Date Sample Recd: 09/21/2001  
Continental File No: 5535  
Continental Order No: 73396  
Client P.O.: John's Sludge

Lab Number: 01092080  
Sample Description: MW #5

Date Sampled: 09/20/2001  
Time Sampled: 1015

Analysis	Concentration	Units	Date Analyzed	Book/Page
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

Analysis	Date Prepared	QC Batch	Analyst	Method(s)
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092080

Lab Number: 01092081  
Sample Description: MW #6

Date Sampled: 09/20/2001  
Time Sampled: 1055

Analysis	Concentration	Units	Date Analyzed	Book/Page
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

Analysis	Date Prepared	QC Batch	Analyst	Method(s)
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092081

-Continued-



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## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 3

Client: City of Wichita

Lab Number: 01092082  
Sample Description: MW #8Date Sampled: 09/20/2001  
Time Sampled: 1135

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092082

Lab Number: 01092083  
Sample Description: MW #9Date Sampled: 09/20/2001  
Time Sampled: 1215

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092083

Lab Number: 01092084  
Sample Description: MW #7Date Sampled: 09/20/2001  
Time Sampled: 1245

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
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CONTINENTAL ANALYTICAL SERVICES, INC.

LABORATORY REPORT

Page: 4

Client: City of Wichita  
Lab Number: 01092084  
Sample Description: MW #7

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092084

Lab Number: 01092085  
Sample Description: MW #2

Date Sampled: 09/20/2001  
Time Sampled: 1430

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/04/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092085

Lab Number: 01092086  
Sample Description: TSWSS #1

Date Sampled: 09/20/2001  
Time Sampled: 1045

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082

-Continued-



## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 5

Client: City of Wichita  
Lab Number: 01092086

Analysis	Date	QC Batch	Analyst	Method(s)
	Prepared			
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092086

Lab Number: 01092087  
Sample Description: BSWSS #1

Date Sampled: 09/20/2001  
Time Sampled: 1055

Analysis	Concentration	Units	Date	Book/Page
			Analyzed	
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

Analysis	Date	QC Batch	Analyst	Method(s)
	Prepared			
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092087

Lab Number: 01092088  
Sample Description: MW #1

Date Sampled: 09/20/2001  
Time Sampled: 1345

Analysis	Concentration	Units	Date	Book/Page
			Analyzed	
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

Analysis	Date	QC Batch	Analyst	Method(s)
	Prepared			
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C

-Continued-

## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 6

Client: City of Wichita  
Lab Number: 01092088

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092088

Lab Number: 01092089  
Sample Description: MW #4

Date Sampled: 09/20/2001  
Time Sampled: 1315

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/27/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/27/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-8	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-8	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092089

Lab Number: 01092090  
Sample Description: TSWSS #2

Date Sampled: 09/20/2001  
Time Sampled: 1015

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/28/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/28/2001	5045/1

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-X	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-X	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

-Continued-

## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 7

Client: City of Wichita  
Lab Number: 01092090

Analysis	Concentration	Units	Date Analyzed	Book/Page
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Conclusion of Lab Number: 01092090

Lab Number: 01092091  
Sample Description: BSWSS #2

Date Sampled: 09/20/2001  
Time Sampled: 1025

Analysis	Concentration	Units	Date Analyzed	Book/Page
PCB in Water	ND(0.5)	µg/L	10/05/2001	4867/223
Aluminum, Dissolved	ND(0.50)	mg/L	09/28/2001	5045/1
Lead, Dissolved (ICP)	ND(0.005)	mg/L	09/28/2001	5045/1

Analysis	Date Prepared	QC Batch	Analyst	Method(s)
PCB in Water	09/26/2001	010926-2	JDL	608/8082
Aluminum, Dissolved	09/26/2001	010926-X	MAG	200.7/6010B
Lead, Dissolved (ICP)	09/26/2001	010926-X	MAG	200.7/6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	608/3510C
ICP Metals Dissolved Preparation Analyst/Method			SKR	200.7/3005A

Conclusion of Lab Number: 01092091

Lab Number: 01092092  
Sample Description: Mud #1

Date Sampled: 09/20/2001  
Time Sampled: 1040

Analysis	Concentration	Units	Date Analyzed	Book/Page
PCB in Solid	ND(0.07)	mg/kg dry wt.	10/03/2001	4867/218
Solids, Total	68.5	% by weight	09/26/2001	4623/29
Aluminum, Total	8080.	mg/kg	10/04/2001	5045/7
Lead, Total (ICP)	16.1	mg/kg	10/04/2001	5045/7

Analysis	Date Prepared	QC Batch	Analyst	Method(s)
PCB in Solid	09/26/2001	010926-6	JDL	8082
Solids, Total	N/A	010926-1	RDC	CAS SOP#OP-4
Aluminum, Total	10/02/2001	011002-6	MAG	6010B
Lead, Total (ICP)	10/02/2001	011002-6	MAG	6010B
Organochlor. Pest./PCB Preparation Analyst/Method			JRT	3540C
ICP Metals Total Preparation Analyst/Method			SKR	3050B

Conclusion of Lab Number: 01092092

-Continued-

## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 3

Client: City of Wichita

Lab Number: 01092093

Sample Description: Mud #2

Date Sampled: 09/20/2001

Time Sampled: 1030

Analysis	Concentration	Units	Date	
			Analyzed	Book/Page
PCB in Solid	ND(0.07)	mg/kg dry wt.	10/03/2001	4867/218
Solids, Total	71.5	% by weight	09/26/2001	4622/29
Aluminum, Total	9790.	mg/kg	10/04/2001	5045/7
Lead, Total (ICP)	13.8	mg/kg	10/04/2001	5045/7

Analysis	Date			
	Prepared	QC Batch	Analyst	Method(s)
PCB in Solid	09/26/2001	010926-6	JDL	8082
Solids, Total	N/A	010926-1	RDC	CAS SOP#OP-4
Aluminum, Total	10/02/2001	011002-6	MAG	6010B
Lead, Total (ICP)	10/02/2001	011002-6	MAG	6010B
Organochlor. Pest./PCB Preparation	Analyst/Method		JRT	3540C
ICP Metals Total Preparation	Analyst/Method		SKR	3050B

Conclusion of Lab Number: 01092093

Laboratory analyses were performed on samples utilizing procedures published in Title 40 of the Code of Federal Regulations, Parts 136 or 141, or in EPA Publication, SW-846, 3rd edition, September, 1986 and the latest promulgated update. ND(), where noted, indicates none detected with the reporting limit in parentheses. Samples will be retained for thirty days unless otherwise notified.

CONTINENTAL ANALYTICAL SERVICES, INC.

*Clifford J. Baker*  
 Clifford J. Baker  
 Technical Manager